

Outgoing
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B&C Limestone water well abandonment

Peter Brinton <peterbrinton@utah.gov>

Wed, Jun 29, 2016 at 6:22 PM

To: John Blake <jblake@utah.gov>

Cc: Paul Baker <paulbaker@utah.gov>

Hi John,

Here's the Well Abandonment Report that has been submitted to Water Rights' well abandonment program by Ralph Brothersen (a licensed well driller): <http://waterrights.utah.gov/docImport/0582/05826996.pdf>. I was present for the placement of the chips and grout.

In the upper (cased) borehole, the amount of bentonite grout used in the cased part of the well and in the annular space was as expected, and I think it was virtually a complete plug.

In the lower (uncased) borehole (for which the original driller did not provide a log to Water Rights), we used fewer bentonite chips (soaked briefly in a diluted polymer solution to delay swelling) than we expected. We took our lunch break after pouring most of the chips in, and the chips may have swelled significantly between the time they were placed and the end of lunch. The last few bags of chips were placed after lunch to an acceptable level above the casing bottom.

It is possible that a bridge of chips occurred somewhere below the casing in the open borehole, resulting in a void of unplugged hole. However, bridging didn't occur at the water level, where bridging is frequently reported to occur. Bridging may have occurred where the well reduced from 6 1/8" to 5" in diameter, immediately below the casing, but nearly all of the chips are known to have been placed below that point. If the chips swelled to 1.6 times their original volume between placement and the end of our break (possible if not likely, as bentonite chips can swell much more than that), then it is reasonable to assume that most (if not all) of the lower borehole would be plugged with bentonite.

If no swelling occurred (unlikely), and assuming no significant voids in the borehole walls were present (unknown, but limestone in this formation is dense), then the unplugged length of borehole would be a maximum of 45 feet and would be located somewhere below the bentonite plug below the cased portion of the well. Such a void, if present, is isolated from the known upper sandstone aquifer in the upper well by significant bentonite below the bottom of the casing.

Based on plugging volumes, bentonite swelling, the well characteristics and geology to the degree that they are known, I am comfortable with the licensed well driller's abandonment. I don't think that there are any significant unplugged voids that will be problematic. That said, few details about the geology of the lower well are known.

Let me know if you have any questions.

Peter

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